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AUTHOR Weimer, Douglas Reid
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ABSTRACT

The purpose of this report is to provide an overview of copyright law as it relates to computer software. The computer industry terminology, case law, and software protection by patents and trade secret legislation are examined, and it is argued that the protection of ownership rights of computer software poses major challenges to existing U.S. copyright law--and to proposals to amend existing laws--due to the rapid development of sophisticated computer technology. Software case law is characterized as an evolving area that must be concerned with subtle distinctions and characterizations of elements of computer software. Two possible courses of legislative action are discussed. The first would allow the current state of copyright law to continue without significant amendment, thereby allowing the general body of copyright law to govern software issues. It is noted that with this approach, courts would use existing law to craft appropriate methods to resolve copyright disputes, and would determine the boundaries of software copyright protection. The second course of legislative action would be to develop a new body of law specifically designed to address software issues such as ownership and protection of intellectual property. It is argued that such an approach might create comprehensive legislation to deal with software copyright issues; however, this approach has not yet received support from either the Congress or industry. References are provided throughout the document. (DB)

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CRS Report for Congress

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Computer Software and Copyright Law

Douglas Reid Weimer
Legislative Attorney
American Law Division

March 26, 1991

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COMPUTER SOFTWARE AND COPYRIGHT LAW

SUMMARY

The protection of the ownership rights of computer software poses major challenges to existing American copyright law and to proposals to amend existing laws. The rapid development of sophisticated computer technology and the frequent changes in this technology have created many legal uncertainties which presently exist involving software ownership and related issues. Concern over these uncertainties is shared by legislators, the academic community, the computer industry, and the business community.

The purpose of this report is to provide an overview of copyright law as it relates to computer software. The computer industry terminology, caselaw, and software protection by patents and trade secret legislation are examined. This report is necessarily limited in scope. It focuses on domestic issues of software protection and does not analyze the international issues of software protection.

At the present time, software caselaw is evolving. While clearly, certain elements of computer programs are subject to copyright protection, many questions remain unresolved concerning the subtle distinctions and characterizations of particular elements of software. Although there has been a general trend to extend copyright protection to computer software, the trend has not been completely uniform. Concern has been raised about the reliance that courts have been placing on expert testimony in the resolution of software copyright issues.

Two courses of legislative action remain open. One path is to allow the current state of copyright law to continue without significant amendment. The effect of this course would be to allow the general body of copyright law to govern software issues. By utilizing this approach, the courts would grapple with existing law to craft appropriate methods to resolve copyright disputes concerning software. Through the development of caselaw, the boundaries of software copyright protection would be determined. The alternative course would be to develop a new body of law specifically designed to address software issues. Such an approach might create comprehensive legislation to deal with software copyright issues. This approach has not received congressional or industry support, and is at the present time a theoretical position.

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COMPUTER SOFTWARE AND COPYRIGHT LAW

INTRODUCTION

The protection of the ownership rights of computer software poses major challenges to existing American copyright law[1] and to proposals to amend existing laws. The rapid development of very sophisticated computer technology and the frequent changes in this technology have created many legal uncertainties which currently exist involving software ownership and related issues.[2] Concern over these uncertainties is shared by legislators, the academic community, the computer industry, and the business community as a whole.

Controversy surrounds the sufficiency of current statutory computer software protection. The central legal, as well as policy issue, is whether or not existing American copyright law is adequate to provide sufficient software ownership protection and to stimulate future software research and development. Two areas of concern are software ownership issues and the positive or negative effect that specific government regulation or nonregulation of software may have on private software industry research and development policies. The legislative course of action or inaction which will be taken concerning future software protection has significant implications.

The purpose of this report is to provide an overview of copyright law as it relates to computer software. The computer industry terminology, caselaw, and software protection by patents and trade secret legislation are examined. This report is necessarily limited in scope. It focuses on domestic issues of software protection and does not analyze the international issues of software protection.[3]

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[1] Under certain circumstances, protection for certain aspects of software programs may be available under American patent and trade secret laws. The primary focus of this report is on American copyright law and computer software.

[2] See, Nichols, COMPUTER LAW, *Grappling with Computer Technology* 9-24 (1989).

[3] References to international issues and computer software: 3 Nimmer, NIMMER ON COPYRIGHT § 17 (1988)(cited to afterward as "Nimmer"); Oman, *Intellectual Property Rights*, CRS REVIEW 23-25 (July/August 1990); Congressional Research Service, ISSUE BRIEF NO. 90-133, *The Uruguay Round: Possible Outcomes and Implications for Congress* 2 (1991); Note, *Intellectual Property Rights and the GATT: United States Goals in the Uruguay Round*, 21 VAND. J. OF TRANSNATIONAL L. 367 (1988); Keplinger, COMPUTER LAW, *International Protection for Computer Programs* 239-280 (1989).

DEFINITIONS

At the outset of the consideration of copyright law and computer software, a basic understanding of several terms utilized in the computer industry is essential. Some of these terms are used in relevant court cases, statutes, legislative proposals, and other areas, and it is necessary to comprehend the meaning and the interplay of these terms.[4]

Intellectual property is a concept which generally embodies those property rights which result from the physical manifestation of original thought.[5] Intellectual property is generally considered to be that property which is able to be protected by patents, trademarks, or copyrights.

A *computer* is a device which is capable of accepting information, applying prescribed processes to the information, and supplying the results of these processes.[6] A computer may also be considered to be a device which receives input (data), operates upon (processes) the input pursuant to specific instructions (program), and responds with a certain output (resulting data or information).[7] The basic function of the computer is to process data or information. There are several categories of computers. A "*mainframe*" is a large-size computer, usually occupying a large room, and is used for large scale data processing. A "*minicomputer*" is usually considered to be a "small business computer" and is a much smaller version of the "mainframe." It is used mainly in office settings. A "*microcomputer,*" also known as a "PC," a personal computer, a desktop, or a "micro," is a much smaller and less expensive version of the minicomputer. It is much smaller than the minicomputer and is widely used in homes and offices for various processing functions. The microcomputers are usually owned by the users, and the mainframe computers and the minicomputers are usually leased by the users.[8]

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[4] For a specialized list of computer terms specially designed for lawyers, see: Nichols, COMPUTER LAW, *Introduction to Computers for Lawyers* 25-44 (1989).

[5] General Accounting Office, GAO REPORT NO. 90-145, *Technology Transfer: Copyright Law Constrains Commercialization of Federal Software* 8 (1990)(cited to afterward as "GAO Report").

[6] Sippl & Sippl, COMPUTER DICTIONARY AND HANDBOOK 98 (1980).

[7] 1 Sherman, Sandison, & Gruen, COMPUTER SOFTWARE PROTECTION LAW § 101.2(a)(1990)(cited to afterward as "Sherman").

[8] *Id.* at 101.2(b).

A *computer program* is defined by federal statute for copyright purposes[9] as a set of statements or instructions to be used directly or indirectly in a computer so as to bring about a certain result. *Source code* is a computer program written in conventional human language and is used directly in a computer. *Object code* is a computer program written in machine-readable language and is used indirectly in a computer. *Microcode*, also known as firmware, is the program which converts source code into object code.[10]

Computer software is usually a synonymous term for *computer program*.[11] Within the scope of this report, computer software is considered to be sets of instructions---programs--for computers. These instructions or programs can be stored in punched cards, magnetic tape, disks, read-only memory (ROM), random-access memory (RAM), semiconductor chips, or on paper.[12] These software programs enable the computer to be usable and to control its performance. Computer software is usually protected through copyright registration, although under some circumstances it may be protected by patents.

Computer hardware usually refers to the actual computer, the computer terminal, keyboard, and related mechanical equipment. Hardware is the device or machine that is needed to carry out a computer task. Computer hardware is usually protected by patents, rather than by copyrights. Courts have been called upon to distinguish computer hardware from computer software. One court made the following distinction: "Hardware is the equipment used in data processing systems, such as the mainframe computer, terminals, printers, memory devices, and the like. Software is the coded instructions which control the way data is processed, for example, individual programs."[13] Another useful distinction to make is that *software instructs the computer, while hardware executes the instructions.*

Interface concepts are how computer programs relate or respond to different entities. A program interfaces with people (user interface), interfaces with other programs (software interface), or interfaces with computers (machine interface).[14]

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9 17 U.S.C. § 101 (1988).

10 Nimmer, at § 2.04 (1988).

11 Sherman, at § 101.5(a).

12 Office of Technology Assessment, Background Paper No. CIT-61, *Computer Software & Intellectual Property* 1 (1990)(cited to afterward as "OTA Paper").

13 *Association of Data Processing Serv. Orgs., Inc. v. Board of Governors of the Fed. Reserve Sys.*, 745 F.2d 677, 692 (D.C. Cir. 1984).

14 OTA Paper, at 3.

An *algorithm* is generally considered to be a set or series of rules which determine a sequence or series of actions to be undertaken to solve a problem or to undertake a process. The rule is carefully set forth and defined so that in principle it can be carried out by a machine.[15] Another way to conceive of an algorithm is the method by which the program will solve a particular problem.

It should be observed that most of these terms are not precisely defined by statute, and that these terms may have slightly differing meanings within the legal community and within the computer industry. Also, within the context of international law, commerce, and trade, some of these terms may have somewhat different meaning and significance.

CONSTITUTIONAL FOUNDATIONS

American copyright law is sanctioned by the Constitution and has been legislatively created by Congress to protect authors against the unauthorized copying of their "original works of authorship."[16] Such works may include literary, dramatic, musical, artistic, computer programs, and other intellectual works.[17] By statute, the copyright owner is given the exclusive right to use and to authorize various uses of the copyrighted work such as reproduction, distribution, display, and derivative use.[18] The violation of any of the copyright owner's rights may result in an action for copyright infringement.[19] However, it should be noted that the rights of the copyright owner in the work are neither absolute nor unlimited in scope.[20]

The "copyright clause" of the U.S. Constitution grants the power to Congress to regulate copyrights.

> Clause 8. The Congress shall have the Power. . . To promote the Progress of Science and the useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.[21]

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15 *Id.* at 22.

16 17 U.S.C. §§ 102 (1988).

17 *Id.*

18 *Id.* § 106.

19 *Id.* §§ 502, *et seq.* (1988).

20 *Id.* § 107.

21 U.S. Const. art. I, § 8, cl. 8.

This constitutional grant of authority has a two-fold purpose. A primary goal of copyright law is to promote the public interest and knowledge, the "Progress of Science and the useful Arts." Another goal of copyright is the protection of the authors' ownership interests in their creative works. While copyright is a property interest of the copyright owner, its primary goal was not envisioned as the collection of royalties or the protection of property. Instead, copyright was developed for the promotion of intellectual pursuits and the increase of public knowledge. This principle has been articulated by the Supreme Court.

> The economic philosophy behind the clause empowering the Congress to grant patents and copyrights is the conviction that encouragement of individual efforts by personal gain is the best way to advance public welfare through the talents of authors and inventors in Science and the useful Arts.[22]

Thus, the foundation of American copyright law is based on a dualism--the public benefit derived from the creativity of authors and the economic reality that a limited copyright monopoly is essential to encourage the greatest creativity of authors. Copyright is sometimes viewed as an economic incentive for creativity for the interest of the public at large. This principle was articulated in the *Sony* videocassette recording case when the court discussed the "difficult balance between the interests of authors and inventors in the control and exploitation of their writings and discoveries on one hand, and society's competing interest in the free flow of ideas, information, and commerce on the other hand."[23]

Within the context of software and copyright, it can be considered that copyright as a protection of ownership interest is a necessary incentive for the creation of innovative software. If no economic gain accrued to the developer of the software, then there would be less incentive to create new and dynamic software. Likewise, if ownership interests in software were totally absolute, less information and knowledge would flow to the public and software innovation and development might be stifled.

CURRENT COPYRIGHT PROTECTION OF COMPUTER SOFTWARE

Generally speaking, computer software is protected by the entire body of copyright law. However, under existing copyright law, there are certain specific provisions which deal with particular aspects of software protection. These statutes have been added to the body of copyright law over the years. This section examines these specific software provisions within the context of their enactments.

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22 *Mazer v. Stern*, 347 U.S. 201, 219 (1954).

23 *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 429 (1984).

1976 Copyright Law Revision

Under the 1976 copyright law revision, only one specific statutory provision was enacted concerning computer and other informational systems.[24] In effect, this provision stated that the owner of copyright in a work did not receive any greater or lesser rights concerning the use of the work in relation to computer systems than those provided under federal law, common law, or state law.[25]

CONTU and the 1980 Copyright Amendments

Because of public, industry, and congressional concern over the protection of computer software, Congress authorized a commission--the National Commission on New Technological Uses of Copyrighted Works (CONTU)--comprised of copyright experts to study the copyright problems arising from the marketing and use of photocopiers and computers.[26] In 1978, CONTU released its final report which recommended a definition of the term "computer program" and a revision to replace the above-mentioned 1976 provision dealing with computer systems and copyright law.[27] Congress, upon the basis of the CONTU recommendations[28] amended the body of copyright law in 1980 to provide a specific definition for "computer program" and to refine the section dealing with computer systems and copyright.[29]

The current statutory definition of computer program remains unchanged since its 1980 enactment.

> A "computer program" is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result.[30]

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[24] Pub. L. 94-553, title I, § 101, Oct. 19, 1976, 90 Stat. 2565.

[25] *Id.* Codified at 17 U.S.C. § 117 (1976)(subsequently amended).

[26] Pub. L. 93-573. § 201, 88 Stat. 1873, Dec. 31, 1974.

[27] See, United States, National Commission on New Technological Uses of Copyrighted Works (CONTU), FINAL REPORT OF CONTU ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, Library of Congress 1-2 (1979).

[28] H.R. No. 96-1307, Part 1, 96th Cong., 2d Sess. 23-24 (1980).

[29] Pub. L. 96-517, §§ 10(a), 10(b), Dec. 12, 1980, 94 Stat. 3028-9. Currently codified at 17 U.S.C. §§ 101, 117 (1988).

[30] 17 U.S.C. § 101 (1988).

The 1976 provision dealing with computer programs was amended so as to permit the creation of copies that are necessary as an "essential step" in utilization of the computer program and as "back-up" copies of computer programs for the personal use of the individual software owner.

§117. Limitations on exclusive rights: Computer programs

> Notwithstanding the provisions of section 106, it is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided:
>
> (1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or
>
> (2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.
>
> Any exact copies prepared in accordance with the provisions of this section may be leased, sold, or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale, or other transfer of all rights in the program. Adaptations so prepared may be transferred only with the authorization of the copyright owner.[31]

Thus, the 1980 amendments legislatively authorized the copyright of computer software and provided a precise definition for computer programs. The amendments also permit the owner of a computer program to make copies of programs for essential steps in the computer program and "back-up" programs for individual owner use.[32] Copies or adaptations of these software programs cannot be leased, sold, or transferred without all of the rights in the program being transferred, and only with the permission of the copyright owner.

Computer Software Rental Amendments Act of 1990

The most recent amendment to copyright law concerning software was the Computer Software Rental Amendments Act of 1990.[33] These provisions amend existing law concerning the effect of the transfer of a particular copy or

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[31] 17 U.S.C. § 117 (1988).

[32] Nimmer, § 8.08 (1989).

[33] Pub. L. 101-650, 104 Stat. 5089, Dec. 1, 1990. [To be codified at 17 U.S.C. § 109].

phonorecord. The existing law (17 U.S.C. § 109(a)(1988)) provided that the owner of a particular copy or phonorecord, without the authority of the copyright owner, is entitled to sell or dispose of that particular copy of the phonorecord. This provision is generally known as the "first-sale" doctrine. Because of concern over the rental, lease, or loan of computer software which might permit unauthorized copying of software, the Computer Software Rental Amendments Act of 1990 modified the "first sale" doctrine with respect to computer programs and other recordings.

Congress had long considered a revision of the "first-sale" doctrine to protect the property interests of copyright owners of computer programs and other audio and visual works.[34] The practical effect of these amendments is to prevent the unrestricted rental, loan, or lease of computer software without the permission of the copyright owner. Congress was persuaded that the rental of software would encourage unauthorized copying, deprive copyright owners of a return on their investment, and hence discourage the creation of new products.[35] Within the context of concern for the protection of copyrighted software and the potential loss of creativity of new software, Congress enacted the software rental legislation.

The amendments provide that computer programs, sound recordings, or phonorecords cannot be disposed of--rental, lease, or lending--without the authorization of the copyright owner. However, an exception is made for the transfer of phonorecords by a nonprofit library or nonprofit educational institution. Another exception is made for the transfer of lawfully made copies of computer programs by nonprofit education institutions to other like institutions.[36] These provisions do not apply to computer programs embodied in a machine or product which can not be copied during the ordinary operation of the machine or product, or a computer program embodied with a limited use computer designed for playing video games.

The amendments further state that within three years of their enactment, the Register of Copyrights is to report to Congress whether the software rental provisions are achieving the intended purpose of maintaining the integrity of the copyright system while providing nonprofit libraries the capability to fulfill their function. This report is to advise Congress concerning any information or recommendations that the Register considers relevant.

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[34] *Computer Software Rental Amendments Act: Hearings on H.R. 2740, S. 198, and H.R. 5297 Before the Subcomm. on Courts, Intellectual Property, and the Administration of Justice of the House Committee of the Judiciary*, 101st Cong., 2d Sess. 1-2 (1990).

[35] H.R. Rep. No. 101-735, 101st Cong., 2d Sess. 6-7 (1990).

[36] *Id.* § 802, 104 Stat. 5134-5135.

It is also provided by the amendments that anyone who distributes a phonorecord or a copy of a computer program in violation of these provisions is considered an infringer of copyright and is subject to the statutory remedies provided in existing copyright law. However, such violation is not to be considered a criminal offense or to be subject to criminal penalties.

These amendments remain in effect until October 1, 1997. Provision is also made regarding the recordation of certain computer programs by the Copyright Office.

COMPUTER SOFTWARE PROTECTION AS JUDICIALLY INTERPRETED

Introduction

Concurrent with the microcomputer[37] revolution which occurred in the 1980's, various software copyright issues have been subject to judicial interpretation. A growing body of caselaw has developed and evolved which has generally, although not always, expanded the scope of copyright protection of computer software.[38] Software is protected in a general way through the entire body of copyright law. Several problems have confronted courts in their analysis of computer software issues. A major problem is the complexity of the subject matter of the litigation--software--and the unfamiliarity of courts in dealing with this subject. A related problem is the rapid technological development of software and the delay in the enactment of legislation and in the judicial determinations to keep pace with these technological developments and innovations.

At the current time, there is not absolute precision regarding the specific parameters of copyright software protection.[39] Generally speaking, software litigation has involved cases concerned with the more ambiguous aspects of what portions of a software program are protected under copyright and related issues concerning the alleged copying of parts or the totality of computer programs. This section considers several key cases in the development of the body of

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[37] See, discussion, p. 2.

[38] For an exhaustive analysis of the current state of software computer law, see: Goldberg, COMPUTER LAW, *Copyright Protection for Computer Software: A Summary of Authorities, With an Emphasis on Current Judicial Developments* 45-170 (1989). See, Tache, *Copyrightability of Computer Languages: Natural Expansion of Copyright Law or Destruction of the Copyright/Patent Distinction?* 72 J. PAT. OFF. SOC'Y 564 (1990).

[39] *Id.*

copyright law concerning computer software. However, the present state of the caselaw is in a period of evolution, and controversy currently exists.[40]

Software Licensing Agreements

The most typical type of licensing agreement concerning software involves the licensor's (copyright owner's) grant of permission to use, copy, or adapt the software for the licensee's (user's) own purposes.[41] Generally, although this is a license arrangement, both parties usually treat the transaction as a sale (i.e., subsequent license fees are usually not collected). Mass marketed software is usually sold through "shrink-wrap" licenses. Shrink-wrap licenses are created when the buyer breaks the shrink-wrap, the cellophane packaging used by mass software marketers. On the package the seller/licensor notifies the buyer that by opening the package, the buyer is required to comply with certain prescribed terms. Such terms typically include restrictions on copying, use, and remedies.[42] Such licensing agreements have troubled the courts and further cloud and confuse the ownership and use issues of the software copyright.[43]

Directly related to the licensing agreement is the issue that many software programs are built, created upon, or derived from existing programs. The analogy of building blocks may be helpful. Thus, existing programs are the foundations or the building blocks for the development of new programs. As the necessary foundation programs may be the property interests of others, licensing or rental arrangements may necessarily have to be entered into between the copyright owner and the software innovator.[44] Such licensing arrangements, while generally compatible with existing copyright law, add to the complexity of the legal issues surrounding copyright and software.

The Principle of "Expression" versus "Underlying Idea"

One long-established copyright concept which many of the courts reviewing the copyright issues of software have considered is the dichotomy between the *expression* of ideas and the *underlying ideas* themselves.[45] In a landmark case,

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[40] Oman, Testimony Before the Subcommittee on Courts, Intellectual Property and the Administration of Justice, Committee of the Judiciary 3 (March 7, 1990)(cited to afterward as "Oman Testimony").

[41] Lipner and Kalman, COMPUTER LAW 413 (1989).

[42] *Id.* at 415.

[43] *Id.* at 425-440.

[44] Remer, LEGAL CARE FOR YOUR SOFTWARE 83-112 (1982).

[45] Nimmer, at § 2.18[J](1989).

Baker v. Selden[46] the Supreme Court had to determine whether an accounting system was subject to copyright, after an article outlining the system was contained in a book.[47] The court found distinctions between a work which *described* an art, method or process from the *actual* art, method, or process itself. The court concluded that the accounting system was not protected through the article which described it. Many of the court decisions involving software copyright relate back to this venerable case and the distinction that it made between the *expression of an idea which is subject to copyright, and the underlying idea or concept, which is not subject to copyright.*

Caselaw Development

Clearly, computer programs are protected under copyright law through the 1980 software amendment.[48] However, questions have been raised concerning which particular portions of a computer program are subject to copyright protection and which are not.[49] A selected number of cases are considered which have dealt with the copyrightability of certain portions of computer programs and the related issue of their unauthorized use, and the attempts made by the courts to define the boundaries of this protection.[50]

Operating System and Applications Programs

The courts have decided a number of cases which involved the issue of whether copyright protects *operating system programs*--which are the programs that control the execution of other internal programs or functions. It was determined that both the operating systems and the *applications programs*--that usually perform a specific task for the computer user, such as word processing--are subject to copyright protection.[51] Hence, it has clearly been determined that the applications programs and the operating systems programs are subject to copyright protection.

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[46] 101 U.S. 99 (1880).

[47] *Id.*, at 104.

[48] 17 U.S.C. § 101 (1988).

[49] Nimmer, at § 2.04[C](1990).

[50] Note, *Idea, Process, or Protected Expression?: Determining the Scope of Copyright Protection of the Structure of Computer Programs*, 88 MICH. L. REV. 866 (1990).

[51] *Apple Computer, Inc. v. Formula Int'l., Inc.*, 725 F.2d 521, 525 (9th Cir. 1984); *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240, 1252 (3d Cir. 1983), *cert. dismissed*, 464 U.S. 1033 (1984).

Source and Object Codes, Microcodes, and Algorithms

Ordinarily, computer programs develop through different levels of development or forms of expression. Among these different levels of development are algorithms, source and object codes, and microcodes.[52] It is generally thought that the structure, sequence, or organization of a program is a form of program expression. This concept is sometimes referred to as the "SSO" of a program. Although there is no caselaw directly on the point, it is generally believed that algorithms *per se* are not subject to copyright protection because of the expression/underlying idea dichotomy. However, as discussed below, algorithms may be subject to patent protection. An extensive body of caselaw supports the principle that source codes[53] and object codes[54] are subject to copyright protection. In *NEC v. Intel Corp.*,[55] it was determined that microcodes were subject to copyright protection.[56]

In *Whelan Associates, Inc. v. Jaslow Dental Laboratory, Inc.*,[57] the court scrutinized whether the structure, sequence or organization of a program was subject to copyright. This case was of significant importance, as it expanded software protection to encompass the *structure* of the program, in addition to its literal program code. In this case, the defendant employed a professional programmer to design a dental management computer program. Upon completion of the program, the defendant translated the original program into a different programming language which was capable for use in a broader group of computers.[58] Plaintiff brought a copyright infringement action against the dental laboratory. The defendant contended that although the two programs were similar, there were significant differences in the style and structure of the two programs so that the defendant's version did not infringe. The court determined that the *idea* of a computerized program for the operation of a dental lab was not subject to copyright protection if there are various ways to implement the idea, then there is expression not unique to the idea. Thus, the idea is capable of implementation in various ways, and although the idea is not

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[52] See, pp. 3-4.

[53] *Whelan Assocs., Inc. v. Jaslow Dental Laboratory, Inc.*, 797 F.2d 1222, 1233 (3d Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987); *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240, 1246-47 (3d Cir.1983), *cert. dismissed*, 464 U.S. 1033 (1984).

[54] *Id.* 714 F.2d 1240, 1243.

[55] 645 F.Supp. 590 (N.D. Cal. 1986).

[56] Nimmer, § 2.04[C](1990).

[57] 609 F.Supp. 1307 (E.D.Pa. 1985), *aff'd*, 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987).

[58] 797 F.2d 1226.

protected, the various implementations of the idea are copyright protected expressions.[59] The significance of this decision is that the court extended copyright protection to protect the program's structure, sequence, and organization.

Screen Displays

Computer programs control the operation of a computer and usually provide some program output. Such output can involve a screen display on a computer terminal. The significance of these screen displays is that they may receive independent copyright protection. The copyright on video games is based upon the screen display of the program. However, the Copyright Office has determined that it will only issue a single registration for a video game display and an underlying computer program which are owned by the same claimant.[60]

The "look and feel" standard is directly related to screen displays of computer software.[61] The "look" concept generally refers to the audiovisual features that the user sees and/or reads. The "feel" concept usually consists of the overall impression of user-friendliness that the program demonstrates. The "look and feel" standard seems to be an extension of the protection for sequence, structure, and organization.

Another case which expanded software protection and dealt with the issue of screen displays was *Broderbund Software, Inc. v. Unison World, Inc.*[62] which expanded the rationale expressed in *Whelan* to encompass not only the code, structure, and organization, but also the audiovisual screen displays created by the program. This case considered the overall structure of the program to include the audiovisual screen displays and hence protected them. In arriving at this conclusion, the court determined that the structure, sequence and layout of the audiovisual displays in the computer program were created chiefly through artistic and aesthetic factors and not by utilitarian factors and hence, were subject to copyright protection.

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[59] *Id.*, at 1236.

[60] 53 Fed. Reg. 21,817, 21,819 (June 10, 1988).

[61] Note, *The New Look and Feel of Computer Software Protection*, 29 AZ. L. REV. 283 (1987).

[62] 648 F.Supp. 1127 (N.D. Cal. 1986).

Some other recent cases have arrived at varying results concerning copyright infringement and the copying of computer programs, although these courts both utilized the "look and feel" test.[63]

The most recent judicial interpretation of the SSO standards related to screen displays was *Lotus Development Corporation v. Paperback Software International.*[64] This decision also provided expansive protection. In this complex determination, the menu command system in the Lotus 1-2-3 spreadsheet program was judicially scrutinized. After an extensive examination of the complex factual issues and legal precedents, the court determined that the Lotus 1-2-3 spreadsheet was a copyrightable nonliteral element of the computer program. The court determined that the defendant's spreadsheet was infringing and that the Lotus command structure, when taken as an entity--including the command terms, the structure and order of the command terms, and the presentation on the screen, and the long prompts--was not precluded copyright protection by the fact that some of the specific command terms were obvious or merged with the idea of such a particular command term. In addition, the court held that the structure, sequence, and organization of the menu command system was a substantial part of Lotus 1-2-3, noting that the defendant went to great length in copying the Lotus menu command system. Subsequent to the court's determination of infringement, Lotus reached an out-of-court settlement with the defendant concerning the Lotus 1-2-3 spreadsheet software. Lotus reported that the defendant agreed to pay $500,000 for violating Lotus' copyrights in 1-2-3 and agreed to stop marketing the infringing spreadsheet products.[65]

Restrictive Interpretations

The expansive approach to software protection has not been uniformly adopted by the courts. Notably, the Fifth Circuit has been reluctant to provide broad software copyright coverage.[66] The Fifth Circuit in *Plains Cotton Cooperative Association of Lubbock, Texas v. Goodpasture Computer Service,*

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[63] *Telemarketing Resources v. Symantac*, 12 USPQ2d 1991 (N.D. Cal. 1989); *Johnson Controls, Inc. v. Phoenix Control Systems, Inc.*, 886 F.2d 1173 (9th Cir. 1989).

[64] 15 USPQ2d 1577 (D.C. Mass. 1990); 40 PAT. TRADEMARK & COPYRIGHT J. (BNA) 219 (July 12, 1990).

[65] 40 PAT. TRADEMARK & COPYRIGHT J. (BNA) 545 (Oct. 25, 1990).

[66] In *Synercom Tech. v. University Computing Co.*, 462 F.Supp. 1003 (N.D. Tex. 1978), decided prior to the 1980 Copyright Amendments, the court declined to find infringement of the sequence and ordering of computer manuals, finding that such SSO was the underling idea, rather than the expression of that idea.

Inc.[67] chose not to follow the *Whelan* idea/expression analysis in a preliminary injunction. The court adopted a restrained scope of protection. The court refused to hold that the structure, sequence, and organization of a program was copyrightable. The case involved structurally and organizationally similar programs and the court held that the similarities between the two programs were due to the actual business circumstances involved and that the design of a program under these circumstances was an idea rather than an expression.[68] The Fifth Circuit again took a restrained approach to software protection in a case involving the use of computer software programs designed to defeat copyrighted anti-copying programs.[69]

Thus, it can be seen that the Fifth Circuit has not followed the expansive approach to copyright protection of computer software which appears to be controlling in the other Federal Circuits.

Discussion

While the above caselaw discussion of copyright protection of computer software may superficially seem to indicate a resolved state of the law, such is clearly not the case. Commentators and courts grapple with the expression versus underlying idea distinction. In certain cases, such a differentiation may be extremely difficult to undertake. Likewise, while copyright protects operating systems and application systems, the complexity of the systems and the task of distinguishing new systems from existing systems may be baffling. These same problems arise with the copyright protection of source and object codes and microcodes. For instance, determinations of substantial similarity and the issue of look and feel may have to be resolved by experts.[70] Such reliance on nonlegal experts may further confuse an already uncertain area of law.

Two approaches have been expressed for dealing with the increasingly complex body of computer law. The dominant approach is that the existing body of American patent and copyright law, if properly applied, is sufficient to protect software.[71] An alternative view is that a *sui generis* approach--that is, a specialized approach through legislation to computer software copyright issues--is necessary in order to deal with the ever-increasing complexities of software

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67 807 F.2d 1256 (5th Cir. 1987), *cert. denied*, 484 U.S. 821 (1987).

68 *Id.* at 1262.

69 *Vault Corp. v. Quaid Software Ltd.*, 847 F.2d 255 (5th Cir. 1988).

70 OTA at 11.

71 *Id.*

copyright.[72] Arguments supporting and opposing these positions can be raised.[73]

Supporters of the existing statutory scheme contend that the existing state of copyright law is adequate and appropriate to resolve copyright software issues. The Register of Copyrights recently testified:

> In judging the appropriateness of the copyright law to protect computer software, it seems clear that in many instances copyright is the logical choice. Often computer software is merely the means for delivering information to a use. For example, in one case a copyrighted manual for commodity investing was infringed by a computer programmer who developed a software product that appropriated the system. . . .It would make no sense to switch to a *sui generis* law merely because a computer system was used to infringe a copyright.[74]

Some supporters of the current regulatory scheme argue that a *sui generis* approach risks obsolescence and lacks a body of legal precedent.[75] It has also been argued that such an approach could cause the undesirable precedent of enacting substantial copyright legislation in order to respond to every new technological advance.

Opposition to a continuation of the current state of the copyright law is based upon the theory that computer software does not fit within the traditional copyright and patent models and that a specialized approach is necessary. Critics contend that the statutory and caselaw are so confused that a new resolution is needed in order to resolve conflicting and inconsistent opinions. By creating a new statutory approach--*sui generis*--the statutes could be expressly tailored to meet the needs of software copyright. However, no specific legislative proposals have been advanced to this end. Neither has the software industry or supporters of this approach postulated specific legislative guidelines to achieve such a result.

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[72] It seems that the *sui generis* approach is founded more in abstract theory and does not have actual legislative proposals espousing such an approach. This approach has not received significant industry or congressional support.

[73] Oman Testimony, at 59-66.

[74] *Id.* at 61.

[75] *Id.*

While the scope of this report cannot evaluate the policy decisions involved in either of these approaches, it is significant to consider these contrasting positions in the discussion of the future of copyright software protection.[76]

At a December 1990 American Bar Association meeting, the subject of software protection and litigation was discussed. Attorneys speaking at this meeting believed that software producers would be less litigious and that "homogenization" of software products would continue.[77] This theory is based on the belief that as software becomes standardized, that it will be more difficult to protect. Thus, as more and more software programs appear similar, but are not exactly alike, the harder it will be to get a court to grant look-and-feel protection. Using the analogy to the automobile industry, a panelist commented:

> "How many cars do you see on the road that from one angle or another look exactly like a Mercedes-Benz? And there's no reason to expect that we're going to be able to impose that kind of restriction and restraint on the software industry. . . . It would be counterproductive for Mercedes-Benz to fight with General Motors over whether or not a General Motors car appears to look like a Mercedes. It's useless. It does nothing for anyone.[78]

Other comments at the ABA meeting involved the belief that courts cannot respond quickly enough to be of practical use for software protection, and that software producers are spending a disproportionate amount of time in litigation over software. It was mentioned that small software companies are unable to pursue copyright remedies against infringers.

While these statements at the ABA meeting may indicate the "homogenization" of software products, it seems unlikely that there will be significant abatement of software litigation. As this report has indicated, various issues regarding software protection remain unresolved and it seems that further judicial interpretation--in the absence of federal legislation--will be necessary to resolve some of the complexities currently surrounding issues of copyright protection and computer software.[79]

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[76] See, Davis, COMPUTER LAW, *Reaching the Limits: Protecting Programming Languages, Macros, Formats, and Computer Hardware under the Copyright Laws* 171-215 (1989).

[77] *Software Standardization Will Make Litigation Less Likely*, 41 PAT. TRADEMARK & COPYRIGHT J. (BNA) 178 (Dec. 13, 1990).

[78] *Id.*

[79] OTA Paper, at 11-16.

PATENT PROTECTION FOR COMPUTER SOFTWARE

The particular expression of an idea is protected by copyright. In contrast to this concept is the theory of patents. The patent can protect a new and useful *process, machine, manufacture, or composition of matter, or any new and useful improvement thereof*[80] that is novel, nonobvious, useful, or to new and useful improvements to these classes of patentable subject matter.[81] In effect, a patent protects the *application* of an idea in a machine or process.

Patentability of software programs has followed a tortuous path. With the microcomputer revolution of the 1980's and the expanded use and marketing of software, interest developed for various means to protect this software. A 1981 Supreme Court decision, *Diamond v. Diehr*[82] initiated the means for patent protection for certain inventions which were concerned with software by delineating the instances under which functions carried out by computers could be treated as patentable subjects. In this case it was held that a patentable process for curing rubber did not become unpatentable because of the inclusion of a mathematical algorithm or computer program.[83] Since this decision, patents have been issued for various software-related inventions including: spell-checking functions, logic-ordering operations for spreadsheet programs, brokerage cash-management systems, and linear-programming algorithms.[84]

To date, the Supreme Court has not determined whether a computer program on its own is sufficient to meet the criteria for patentability. Currently, the present time, the Patent and Trademark Office (PTO) considers computer software to be a mathematical algorithm. It is PTO policy not to issue patents for computer software alone, as PTO considers a mathematical algorithm as similar to a law of nature and therefore not falling within one of the four classes of patentable subject matter: process, machine, manufacture, or composition of matter.[85] According to PTO's Official Gazette, patent examiners at PTO apply a two-step test for the determination of whether the application of a mathematical formula (i.e., algorithm, or computer program) to a known structure or process is subject to patent protection. Step one: whether the patent claim directly or indirectly recites a mathematical algorithm; and two: whether the algorithm, applied in any manner to physical elements or process

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80 35 U.S.C. § 101 (1988).

81 *Id.*, at § 102.

82 450 U.S. 175 (1981).

83 See, page 2.

84 OTA Paper, at 8.

85 GAO Report, at pp. 10-11.

steps.[86] Both steps must be met in order to receive patent protection for the algorithm.[87]

At the present time, it appears that despite the above-mentioned PTO guidelines, there is still uncertainty and ambiguity concerning the precise nature of the patentability of computer software.[88] Many potential problems may arise from the utilization of a combination of copyright and patent protection for computer software. A major foreseeable problem is determining precisely what aspects of the software have been protected by one or the other form of protection.[89]

The body of patent law and computer software is broad and cannot be fully analyzed in this report.[90]

TRADE SECRET PROTECTION FOR COMPUTER SOFTWARE

An alternative means to protect certain information from misappropriation is trade secret laws. An extended discussion of trade secrets is beyond the scope of this report.[91] There is currently no federal trade secret legislation. Twenty-seven states have enacted trade secret legislation, although the scope of coverage of this legislation and its applicability to computer software varies.[92] In order for a software developer/manufacturer to maintain software as a trade secret, the software and its processes must not be generally known to a competitor and an effort must be made to ensure its trade secrecy.[93]

It has been contended that the use of trade secret legislation to protect software may have undesirable effects. By utilizing trade secret protection, lack

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[86] *Patentable Subject Matter: Mathematical Algorithms and Computer Programs*, 1106 O.G. 4, Sept. 5, 1989.

[87] OTA Paper, at 22.

[88] Oman Testimony, at pp. 52-55.

[89] In theory, copyright registration does not preclude patent registration and vice-versa. In practice, such cross-registration is unusual.

[90] For an in-dept discussion for patent protection for computer software, see, Sherman, §§ 401, *et seq.*

[91] For a detailed discussion of trade secret protection for computer software, see, Sherman §§ 300, *et seq.*

[92] *Id.* at § 302.2(e).

[93] OTA Paper, at 23-24.

of knowledge about software may lead to lack of information about the current state of software development. In turn, this may lead to a retardation in research and development in the area of software development.[94] Hence, the extensive utilization of trade secret legislation may ultimately slow software research and development effects.

SOFTWARE LEGISLATION IN THE 102D CONGRESS

At the current time, specific legislation to significantly alter the copyright treatment of software has not been introduced. As has been previously mentioned, a *sui generis* approach to software protection--which would provide specific legislation to deal with the protection of computer software--has been a theoretical approach, rather than a practical alternative. It does not seem that such a legislative course of action is imminent.

The legislation which has been introduced in the 102d Congress concerning computer software deals with the coordination of federal research programs so as to continue American leadership in the computer industry,[95] rather than addressing specific computer software protection issues.

CONCLUSION

This report has examined the role of copyright law in the protection of computer software. The report has considered the underlying principles of American copyright law, specific provisions of copyright law which relate to software, and judicial interpretations of copyright law and software. The current state of software caselaw is evolving. While clearly certain elements of computer programs are subject to copyright protection, many questions remain unresolved concerning the subtle distinctions and characterizations of particular elements of software. Although there has been a general trend to extend copyright protection to computer software, the trend has not been uniform. Concern has been raised concerning the reliance that courts have been placing on expert software testimony in resolving software copyright issues.

Two courses of legislative action remain open. One path is to allow the current state of copyright law to continue without significant amendment. The effect of this course would be to allow the general body of copyright law to govern software issues. By utilizing this approach, courts would grapple with existing law to craft appropriate methods to resolve copyright disputes concerning software. Through the development of caselaw, the boundaries of software copyright protection would be determined. The alternative course

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[94] *Id.* at 23.

[95] H.R. 191, 102d Cong., 2nd Sess. (1991); H.R. 656, 102d Cong., 1st Sess. (1991); S. 272, 102d Cong., 1st Sess. (1991); S. 343, 102d Cong., 1st Sess. (1991)..

would be to develop a new body of law specifically designed to address software issues. Such an approach might create comprehensive legislation to deal with software copyright issues. This approach has not received congressional or industry support and is at the present time a theoretical position.

Douglas Reid Weimer

Douglas Reid Weimer
Legislative Attorney